

FINGER TAPPING TEST

1. Background and Rationale

Neurologic control of motor performance is a potentially important mediator of the relationship between muscle mass and physical function. Tests of integrated reaction time have been tried in other studies to assess both cognitive perception and motor output but are time consuming and require expensive equipment to do properly.

For the Finger Tapping Test, using an available PC and a mouse, the participant clicks the mouse key as rapidly as possible for 15 seconds. This test attempts to measure motor output in terms of fine motor speed. It was developed by a neurologist. A recent publication shows that the score on this test is correlated with MRI evidence of white matter disease.¹ While both hands can be tested, they are highly correlated, so that just the dominant hand should be adequate. (Note, however that the non-dominant hand can be used if the dominant hand cannot be tested.)

2. Equipment and Supplies

- The computer used for the Pulmonary Function Test (PFT)
- Each site will have 2 or 3 exact mice.
- Finger tap software: software for this task will be installed on the PFT computer. Only the PFT computer should be designated for this task.
- Mouse pad

3. Safety Issues and Exclusions

Participants with severe hand pain, recent surgery, or amputation which would interfere with the performance of this test should be excluded. This should be rare.

4. Subject and Exam Room Preparation

- The computer should be placed on a desk or desk-height table.
- Seat the participant at the computer in a comfortable position within easy access of the mouse.

5. Detailed Measurement Procedures

5.1 General Issues/Description

The participant should be seated, with the wrist or palm resting on the mouse or table and the forearm on the table. The test is demonstrated, and a brief practice (5 seconds) is allowed.

The participant clicks the mouse as rapidly as possible for 15 seconds. The number of taps completed in 15 seconds is tallied by the computer and recorded.

The preferred hand for performing this test is the dominant one. However, if there is severe pain or recent surgery has been performed on this hand, test the other hand after asking exclusion questions.

5.3 Administration

1) Determination of exclusion

Determine which is the participant's dominant hand

Script: "Are you right or left handed?"

Determine if participant has severe hand pain or has had recent surgery on their dominant hand.

Script: "Do you have severe pain or have you had recent surgery on your (dominant) hand?"

If the answer is "no" test dominant hand. If the answer is "yes" ask the same question about their non-dominant hand.

Script: "Do you have severe pain or have you had recent surgery on your (non-dominant) hand?"

If the answer is "yes" do not administer the finger tapping test.

2) Describe the test

Regardless of the participant's previous experience, assure them that there will be time to become familiar with the equipment.

Script: "Now we are going to measure finger dexterity using one of our personal computers and a mouse. I'd like you to sit at the computer and get in a comfortable position. Then reach over and place your (left/right) hand on the mouse."

Allow the participant to handle the mouse and click it several times in order to become familiar with it. MAKE SURE THAT THE PARTICIPANT'S WRIST OR PALM (depending on hand size) IS RESTING ON THE MOUSE OR ON THE TABLE when clicking the mouse. The participant's wrist may NOT be extended in the air. The participant will be clicking the left mouse button. You can hear an audible click. While time to become familiar with the equipment is allowed, do NOT allow a practice session longer than 5 seconds because fatigue may affect the score.

3) Demonstrate the procedure

NOTE: Look at the fingertap menu on the computer screen and press the appropriate key before the participant begins tapping.

Script: "Now place your hand on the mouse and when I say Ready! Go! Begin tapping as fast as you can. Ready, Go! - keep going . . . keep going . . . okay, stop."

Record the number of taps the participant made in 15 seconds.

4) Scoring

Record which hand is being tested.

Record the number of taps made in 15 seconds. This number is displayed on the computer screen.

5) Repeat the test after 15 to 20 seconds.

6. Procedures for Performing the Measurement at Home

Not applicable

7. Alert Values/Follow-up/Reporting to Participants

When the test is completed, tell the participant how many taps were completed in 15 seconds, and that they did just fine.

8. Quality Assurance

8.1 Training requirements

The technician requires no special qualifications or prior experience to perform this assessment. Training should include:

- Read and study manual
- Attend Health ABC training session on techniques (or observe administration by experienced examiner)
- Practice on other staff or volunteers
- Discuss problems and questions with local expert or QC officer

8.2 Certification requirements

- Complete training requirements
- Recite exclusions
- Conducts exam on two volunteers while being observed by QC officer:
(According to protocol, as demonstrated by completed QC checklist)

8.3 Quality Assurance Checklist

- ☐ Participant seated properly at computer:
 - ☐ participant comfortable, arm extended for easy access
 - ☐ hand on mouse, index finger on left button, participant's wrist or palm is resting on the mouse or on the table.

- ☐ Explanation of procedure:
 - ☐ assures participant there will be time to familiarize self with equipment
 - ☐ covers all key points in script for explanation of test
 - ☐ allows participant to handle mouse and click it several times - does not exceed 5 seconds
 - ☐ demonstrates procedure
- ☐ Records hand to be tested
- ☐ Gives proper instruction to begin - "Ready, go! Begin tapping..."
- ☐ Presses computer key before participant begins tapping
- ☐ Gives proper encouragement - "keep going...keep going...okay, stop"
- ☐ Records number of taps participant made in 15 seconds
- ☐ Repeats test properly
- ☐ Reviews form for completeness
- ☐ Correctly completes form

9. References

1. Longstreth WT Jr; Manolio TA; Arnold A; Burke GL; Bryan N; Jungreis CA; Enright PL; O'Leary D; Fried L. Clinical correlates of white matter findings on cranial magnetic resonance imaging of 3301 elderly people. The Cardiovascular Health Study. Stroke, 1996 Aug, 27(8):1274-82.

10. Form